

**Chapter Project****Make a Model of Earth**

How can you make a model that shows both what's inside planet Earth and how the inside affects features on the surface? In this project, you will work in a group to design and create just such a model.

First, you will make sketches of your own design for a three-dimensional model of Earth's interior. Since your model of the interior will have to be to scale, you will need to use a scale in your sketches. Then you will meet with your group to review all members' designs and agree on a single design for a model of Earth's interior. As you and other group members learn more about plate tectonics, you will make new sketches for adding features of Earth's surface to your model. As you learn more about Earth's structure, you will want to make changes in the design of your model. At the end of the project, your group will present your finished three-dimensional model to the class.

**Project Rules**

- Devise a scale and make a sketch of the layers of Earth, as described in Worksheet 1. Keep any sketches you make in a Project Folder. You will show your sketch or sketches to your teacher and discuss your ideas for a model at the end of Section 1.
- With your group, review one another's sketches and ideas. Come to a consensus on a design for the model you want to build as a group, and begin collecting the materials you will need.
- Make sketches of surface features that you want to include on your model, including features associated with sea-floor spreading and plate boundaries as described in Worksheet 2. You will show your sketches to your teacher and discuss your ideas for a revised model at the end of Sections 4 and 5.
- Begin building the base of your model as soon as possible. Then, as you learn new information, you can add to your design and build the model from the core out to the surface.
- With your group, revise your initial model to include surface features, including at least three plates, three plate boundaries, and two continents.
- With your group, prepare a presentation to the class of your completed model. As part of this presentation, you will explain what your model includes, what scale you used for the interior layers, and how your model shows how Earth's interior affects its surface.

## Project Hints

- Look through textbooks and encyclopedias to find drawings that show Earth's interior and surface features. When you find one that looks interesting and informative, think of ways you could make that drawing into a three-dimensional model.
- As soon as possible, begin collecting the materials you will use to build your model. Your teacher may be able to provide some materials, but you will probably need to bring some materials and tools from home.
- Work closely with other members of your group, and listen to their ideas. You might find that someone in your group has just the right idea to make your own design a great deal better.
- Don't be afraid to change your group's design if it doesn't seem to come together well after you've begun construction.
- Make sure your model includes everything that is necessary to inform the viewer about plate tectonics.
- Try to make your model accurate and informative, but also try to make it as artistically pleasing as possible. Encourage members of your group who have artistic talents to put finishing touches on the model.

## Project Time Line

Task	Due Date
1. Complete design and sketches for Worksheet 1	_____
2. Agree on a group design for model	_____
3. Collect and test materials	_____
4. Agree on how group will show surface features on model	_____
5. Finish collecting materials	_____
6. Construct final model	_____
7. Prepare class presentation	_____
8. Present the model to the class	_____

## A Scale Model of Earth's Interior

This worksheet will help you get started making a design for your model of Earth's interior.

### Making Layers to Scale

1. What is the distance from the surface of Earth to the center?  
\_\_\_\_\_ km
2. How large will your model be, from the outside to the center?  
\_\_\_\_\_ cm
3. Divide your answer to Question 1 by the answer to Question 2 to calculate the scale you will use when building your model.  
1 cm = \_\_\_\_\_ km

4. Name the layers of Earth that you will include in your model, and write how thick each one is. Then use another sheet of paper to compute the thickness of each layer to the scale you will be using.

Layer	Thickness	Thickness to Scale
	km	cm
	km	cm
	km	cm

### Planning a Model of Earth

5. Write a description of the model you think your group should build.

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6. What materials will you need to build this model?

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7. On a separate sheet of paper, make a sketch of a model your group could build. Keep the sketch in your Project Folder. Take this worksheet and your sketch to your group meeting. Talk over your ideas with group members.

## Adding Surface Features to the Model

Now that you've learned more about the structure of Earth, you will want to make some changes to your model design. This worksheet will help you organize these changes. Use the back of this sheet if you need more space.

### Sea-Floor Spreading

1. What features must be added to show sea-floor spreading on the model?

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2. What features must be added to show the process of subduction?

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3. What materials could be used to add these features to the model?

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### Plate Tectonics

4. Briefly describe three plate boundaries that could be added to the model.

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5. How could convection currents be shown in the model?

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6. What other features of the surface should also be included in the model?

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7. What materials could be used to add these features to the model?

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8. On a separate sheet of paper, make a sketch of the revised model that your group could build. Keep the sketch in your Project Folder. Take this worksheet and your sketch to your group meeting. Talk over your ideas with group members. Then construct the final model.

**Plate Tectonics** ▪ *Chapter Project*
**Scoring Rubric**

**Chapter Project**

# Make a Model of Earth

In evaluating how well you complete the Chapter Project, your teacher will judge your work in four categories. In each, a score of 4 is the best rating.

	4	3	2	1
<b>Individual Sketches and Designs</b>	Makes sketches that show originality of design and a thorough understanding of Earth's interior and plate tectonics.	Makes sketches that show some originality of design and a good understanding of Earth's interior and plate tectonics.	Makes sketches that show an adequate design and some understanding of Earth's interior and plate tectonics.	Makes sketches that show an incomplete or inappropriate design and little understanding of Earth's interior and plate tectonics.
<b>Constructed Model of a Cut-Away Earth</b>	Model is well constructed and includes Earth's layers made to scale, at least three plates and plate boundaries, two continents, and clear, accurate labels of all features on the model.	Model is constructed adequately and includes Earth's layers made to scale, at least two plates and plate boundaries, two continents, and accurate labels of all features on the model.	Model construction is a little sloppy, and model is missing one or two features. Accurate labels of most features on the model are included.	Model is poorly constructed and missing two or more major features. Labels are incomplete, inaccurate, or missing.
<b>Presenting the Model to the Class</b>	Makes a thorough and interesting presentation that includes a clear, accurate explanation of what the model shows about Earth's layers and plate tectonics.	Makes a thorough presentation that includes a satisfactory explanation of what the model shows about Earth's layers and plate tectonics.	Makes a presentation that includes a partial explanation of what the model shows about Earth's layers and plate tectonics.	Makes a presentation that includes an incomplete and/or inaccurate explanation of what the model shows about Earth's layers and plate tectonics.
<b>Participating in the Group</b>	Takes a lead in planning, constructing, and presenting the model.	Participates in all aspects of planning, constructing, and presenting the model.	Participates in most aspects of planning, constructing, and presenting the model.	Plays a minor role in planning, constructing, and presenting the model.